

embodiment could be made which would be operable. All such modifications, which are within the scope of the claims, are intended to be within the scope and spirit of the present invention.

Having, thus, described the invention, what is claimed is:

5 1. An oil filter, comprising:

a hollow housing having an inlet and an outlet and defining a chamber therein with a flow path between the inlet and outlet;
a mechanically active filter member disposed inside the housing in the flow path; and
a chemically active filter member disposed inside the housing in the flow path;

10 wherein the chemically active filter member comprises a plurality of particles comprising a beneficial additive to be released into engine oil as said engine oil circulates through the filter, said particles comprising an oil conditioning agent selected from the group consisting of imidazoline-phosphonate salts, substituted triazoles, sulfurized carboxylates, phenolic compounds, arylamino compounds, substituted thiazoles, substituted thiadiazoles, phosphosulfurized olefins, zinc dithiophosphates, and zinc dialkyldithiophosphates, aromatic sulfides, aromatic polysulfides, alkyl sulfides, alkyl polysulfides, sulfurized olefins, sulfurized carboxylic acid esters, sulfurized ester-olefins, and mixtures thereof.

15 2. The oil filter of claim 1, wherein said particles further comprise a basic salt

20 selected from the group consisting of calcium carbonate, potassium carbonate, potassium bicarbonate, aluminum dihydroxy sodium carbonate, magnesium oxide, magnesium carbonate, zinc oxide, sodium bicarbonate, sodium hydroxide, calcium hydroxide, potassium hydroxide, and mixtures thereof.

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3. The oil filter of claim 1, wherein the particles further comprise a polymeric binder selected from the group consisting of polyamides, polyimides, polyesters, polyolefins, polysulfones, and mixtures thereof.

4. The oil filter of claim 1, wherein the mechanically active filter element is substantially cylindrical in shape, and wherein the chemically active filter element is also substantially cylindrical in shape and is disposed radially and coaxially inside of said mechanically active filter element.

5. The oil filter of claim 1, wherein the particles of the chemically active filter member are connected together to form a substantially integral permeable member.

6. The oil filter of claim 1, wherein the particles are a product of a process comprising the steps of:

providing the polymeric binder in a finely divided form;
mixing the polymeric binder with the additive in a liquid solvent;
forming the mixture of binder and salt into particles; and
removing the solvent from the particles by evaporation.

7. An oil filter comprising:
a hollow housing having a tapping plate for placement proximate an engine surface, said tapping plate having an outlet aperture formed therethrough and an inlet aperture formed therethrough and spaced apart from said outlet aperture;
a mechanically active filter element disposed within said housing spaced away from said tapping plate;
a substantially cylindrical dividing wall member disposed within said housing adjacent said tapping plate;
said dividing wall member defining an inlet flow channel on the outside

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thereof within the housing and in fluid communication with said inlet aperture of said tapping plate,

5 said dividing wall member further defining an outlet flow channel therein in fluid communication with said outlet aperture of said tapping plate; and a chemically active filter member disposed within said inlet flow channel of said housing between said tapping plate and said mechanical filter element,

10 said chemically active filter member comprising a plurality of particles having a diameter in a range of 0.10 to 5 mm, said particles comprising a beneficial additive to be released into engine oil as said engine oil circulates through the filter, said beneficial additive comprising

15 an oil conditioning agent, selected from the group consisting of imidazoline-phosphonate salts, substituted triazoles, sulfurized carboxylates, phenolic compounds, arylamino compounds, substituted thiiazoles, substituted thiadiazoles, phosphosulfurized olefins, zinc dithiophosphates, and zinc dialkyldithiophosphates, aromatic sulfides, aromatic polysulfides, alkyl sulfides, alkyl polysulfides, sulfurized olefins, sulfurized carboxylic acid esters, sulfurized ester-olefins, and mixtures thereof.

20 8. The oil filter of claim 7, further comprising a foraminous divider disposed between the chemically active filter element and the mechanically active filter element.

9. The oil filter of claim 7, wherein the particles of the chemically active filter element are a product of a process comprising the steps of:

20 separating the polymeric binder into a finely divided form;
mixing the polymeric binder with the additive in a liquid solvent;
forming the mixture of binder and additive into particles; and
removing the solvent from the particles by evaporation.

10. The oil filter of claim 7, wherein the particles further comprise a basic salt selected from the group consisting of calcium carbonate, potassium carbonate, potassium bicarbonate, aluminum dihydroxy sodium carbonate, magnesium oxide, magnesium carbonate, zinc oxide, sodium bicarbonate, sodium hydroxide, potassium hydroxide, calcium hydroxide, and

5 mixtures thereof.

11. An oil filter, comprising:

a hollow housing having an inlet and an outlet and defining a chamber therein with a flow path between the inlet and outlet;

a mechanically active filter member disposed inside the housing in the flow path; and
a chemically active filter member disposed inside the housing in the flow path;

10 wherein the chemically active filter member comprises a plurality of particles comprising a beneficial additive to be released into engine oil as said engine oil circulates through the filter, said particles comprising an antioxidant.

15 12. An oil filter, comprising:

a hollow housing having an inlet and an outlet and defining a chamber therein with a flow path between the inlet and outlet;

a mechanically active filter member disposed inside the housing in the flow path; and
a chemically active filter member disposed inside the housing in the flow path;

20 wherein the chemically active filter member comprises a plurality of particles comprising a beneficial additive to be released into engine oil as said engine oil circulates through the filter, said particles comprising an anti-wear agent.

13. A supplemental cartridge for use in conjunction with an oil filter, said

supplemental cartridge comprising:

a hollow housing, comprising

5 a tapping plate for placement proximate an engine surface, said tapping plate having an outlet aperture formed substantially centrally therethrough and an inlet aperture formed therethrough and spaced apart from said outlet aperture;

10 a cap opposite said tapping plate for placement proximate an oil filter, said cap having an inlet aperture formed substantially centrally therethrough and an outlet aperture formed therethrough and spaced apart from said inlet aperture;

15 an outer wall connecting said cap and said tapping plate;
a substantially cylindrical dividing wall member disposed within said housing and separating said housing interior into an inlet flow channel in fluid communication with said inlet aperture of said tapping plate, and an outlet flow channel in fluid communication with said outlet aperture of said tapping plate; and

20 a chemically active filter member disposed within said inlet flow channel of said housing, said chemically active filter member comprising a plurality of particles having a diameter in a range of 0.10 to 5 mm, said particles comprising:

25 an oil conditioning agent, selected from the group consisting of imidazoline-phosphonate salts, substituted triazoles, sulfurized carboxylates, phenolic compounds, arylamino compounds, substituted thiazoles, substituted thiadiazoles, phosphosulfurized olefins, zinc dithiophosphates, and zinc dialkyldithiophosphates, aromatic sulfides, aromatic polysulfides, alkyl sulfides, alkyl polysulfides, sulfurized olefins, sulfurized carboxylic acid esters, sulfurized ester-olefins, and mixtures thereof.

30 14. The supplemental cartridge of claim 13, wherein the particles further comprise a basic salt selected from the group consisting of calcium carbonate, potassium carbonate, potassium bicarbonate, aluminum dihydroxy sodium carbonate, magnesium

oxide, magnesium carbonate, zinc oxide, sodium bicarbonate, sodium hydroxide, potassium hydroxide, calcium hydroxide, and mixtures thereof.

15. The supplemental cartridge of claim 13, wherein the particles of the chemically active filter element are a product of a process comprising the steps of:

5 separating a polymeric binder into a finely divided form;

mixing the polymeric binder with the additive in a liquid solvent;

forming the mixture of binder and additive into particles; and

removing the solvent from the particles by evaporation.

16. The supplemental cartridge of claim 13, further comprising:

10 an auxiliary inlet tube attached to said outer wall of said housing and being in fluid communication with said inlet flow channel thereof; and

an auxiliary outlet tube attached to said outer wall of said housing and being in fluid communication with said interior thereof.

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